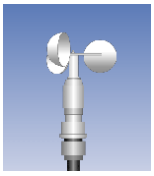
The Space Place

spaceplace.nasa.gov &
spaceplace.nasa.gov/teachers_page2.htm

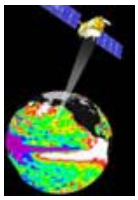
Math-related Activities

The following classroom activity articles developed by NASA's "The Space Place" educational outreach program have been published in past issues of The Technology Teacher, the journal of the International Technology Education Association (ITEA) (http://www.iteawww.org/). These activities are now available in Adobe Acrobat (.pdf) format so that all teachers may use them.



Write the Book on Weather Metrics
(http://spaceplace.nasa.gov/teachers/GOES_weather_book.pdf)
Introduces weather terminology. Invites students to investigate how we measure the weather and other characteristics of the atmosphere and create their own "Book of Weather Metrics."
Disciplines: Math, science, technology, art
Activity: Individual creative classroom and homework assignment.

Packing for a L-o-o-o-ng Trip to Mars
(http://spaceplace.nasa.gov/teachers/mars_packing.pdf)
Decide what you will need to take on a 2-1/2 year journey to Mars. Then plan how to fit everything into a 1-cubic-meter box, using only a measuring tape, pencil and paper, and math.
Disciplines: Math, space science
Activity: Group (cooperation, compromise), technical drawing, discussion

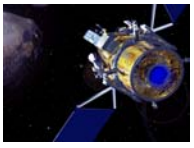


Mapping the Watery Hills and Dales
(http://spaceplace.nasa.gov/teachers/jason_gps.pdf)
Learn how the Global Positioning System satellites work. Find out how the Topex and Jason-1 satellites use GPS data in making very precise topological maps of the oceans.
Disciplines: Earth science, geometry, space technology
Activity: Entire class, indoor, game-type demonstration

Be Glad You're Not a Cyclops!
(http://spaceplace.nasa.gov/teachers/urbie_stereo_vision.pdf)
What is stereoscopic vision and why do we need it?
Disciplines: Biology, math
Activity: Pairs (in turn within large group), hands-on experiment, indoor

De-twinkling the Stars
(http://spaceplace.nasa.gov/teachers/adaptive_optics.pdf)
How do astronomers remove the distortion in starlight caused by Earth's atmosphere?
Disciplines: Physics, math, Earth science, astronomy
Activity: Large group, kinesthetic, outdoor

Make a Scale Model of the Solar System
(http://spaceplace.nasa.gov/teachers/comet_orbits_cnsr.pdf)
Drawing a scale model of the orbits of the planets and some short-period comets.
Disciplines: Math, physics, astronomy
Activity: Individual and large group, hands on, indoor and outdoor. Adaptable to grades 9-12.



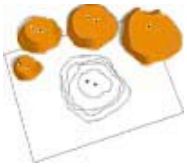
You've Got Algo-rhythm!
(http://spaceplace.nasa.gov/teachers/beacon_monitor.pdf)
How do space scientists program a computer to be smart enough to make up its own mind?
Disciplines: Math, language arts, visual arts
Activity: Small groups (3-5), kinesthetic, hands-on, indoor

Some Other Math-related Activities and Fun Facts on The Space Place

What is the Secret Code Used by the Voyager Spacecraft?
(http://spaceplace.nasa.gov/vgr_fact1.htm) (Dr. Marc's fun facts.)
Learn the "secret code" spacecraft use to send images back from space. Introduces the "language" of computers and spacecraft. Binary and hexadecimal notation explained simply and clearly. Fun fact, with lots of great pictures of the planets.

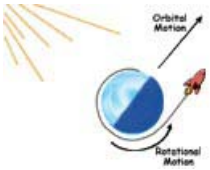
What Batteries Will Last into Your Old Age?
(http://spaceplace.jpl.nasa.gov/st5_bats.htm) (Dr. Marc's fun facts.)
Find out how long the special batteries being tried in space would last if you could use them in your Gameboy. Enter your age now, the number of hours you play each day, then hit the calculate button to find out how old you will be before you would have to put in new batteries.

How Are Space Engineers Way Wilier Than Superheroes?
(http://spaceplace.nasa.gov/dsn_fact1.htm) (Dr. Marc's fun facts.)
Learn about the super "hearing" of the huge antennas used to receive the tiny signals from far away spacecraft. Get a sense of tiny fractions and decimals, such as 1 thousandth and 1 millionth.



Make a Topographical Map
(http://spaceplace.nasa.gov/srtm_makemap.htm)
(Make spacey things.) Build your own mountain of clay or Play-Doh, then make a topo map of it. Teaches how topo maps are made and how to read them. Explains how radar is used from space to make topo maps of Earth.

Shrink a Building Three Ways
(http://spaceplace.nasa.gov/eo3_compression.htm) (Space science in action.)
See how a "skyscraper's worth" of information can be shrunk to a tiny handful without losing the important stuff. Interactive multimedia demonstration shows three different ways (algorithms) to compress data gathered by a spacecraft before sending it back to Earth.



Launch a Rocket from a Spinning Planet
(http://spaceplace.nasa.gov/ds1_mgr.htm) (Space science in action.)
Playground demonstration (using a merry-go-round) of angular momentum and why rockets are launched in a certain direction and at a certain time to take advantage of Earth's rotational velocity. Includes explanation, with animated graphics.

How Far Can a spacecraft Fly in One School Year?
(http://spaceplace.nasa.gov/ds1fact2.htm) (Dr. Marc's fun facts.)
How big a ball of yarn would you need in order to reach from right here to the Deep Space 1 spacecraft 188 million kilometers from Earth?

We welcome teacher feedback!
Please send to spaceplace@jpl.nasa.gov